

BRENELL MARK 6 STEREO UNIT

Operating Instructions

This machine is for use on AC supplies only.

Mains Adjustment Plug

Before connecting the recorder to the AC mains supply check that the mains adjustment plug, situated in the circular recess at the rear of the cabinet, is set to the correct position, i.e.

240V	for	mains	supplies	of	220V	to	250V
210V	"	"	"	"	200V	to	220V
110V	"	"	"	"	100V	to	125V

Mains Cable

This is a 3 cord cable stored in the pocket situated near the carrying handle. To this cable a suitable 3 pin plug should be connected as follows:-

Earth pin to Yellow/Green

Live " " Brown

Neutral pin to Blue

Loading the Tape

Fit the full reel of tape to the left-hand spoolholder so that the tape feeds from the L.H. side of the machine through the slot between the head covers and via the adjustable tape guide to the empty reel which should be fitted to the right-hand spoolholder.

If correctly laced, the glossy side of the tape will be facing the operator and the tape will lie between the heads and pressure pads and also between the two pins near the left-hand tape guide, i.e. in front of the auto-stop pin which moves in the slot but to the pad side of the pin which is attached to the Erase (left-hand) pressure pad arm.

Care should be taken to ensure that the tape does not become twisted when attaching it to the empty reel, i.e. the coated side of the tape must face the hub.

Spool Retaining Screws

Screws are supplied for retaining the reels of tape on the spoolholders. It is advisable to fit these even though the machine is not being used in the vertical position.

Adjustable Tape Guide

The extreme right-hand tape guide may be moved in the vertical plane in order to feed the tape to the take-up reel without it touching the edges of the reel. To adjust, hold lower milled edge and turn upper edge in an anti-clockwise (unscrewing) direction. You will then have two sections which may be re-locked at the height necessary to feed the tape centrally to the take-up reel by holding the lower section and screwing the upper section hard against it.

Deck Switches

The two large knobs control the Fast Wind, Fast Rewind, Record and Replay functions of the deck whilst the small knob is used in the selection of the tape speed.

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Push Buttons marked 4.75, 9.5, 19 and 38 are selected to coincide with the tape speed and should be used in both the record and replay functions. The selection of the buttons will not affect the signals heard when 'A' button is pressed.

The Upper, Lower, Stereo buttons should be used for making recordings upon the indicated tracks. Mono recordings on two track machines should be made with the Upper button pressed but four track machines will require the use of both Upper and Lower buttons for mono recordings (details under 'Recording Procedure').

The extreme right-hand button switches the power supply to both deck and amplifiers. Power 'ON' will be indicated by the illumination of the meters.

Sockets:- Aux and Mic

Two of each are provided. Signals to be recorded on the Upper track of the tape must be fed into the upper sockets (signals from the left-hand channel of the Hi Fi pre-amps. when recording stereo) whilst the lower sockets will receive signals to be recorded on the lower track of the tape (right-hand channel when recording stereo).

Two Output Sockets

One per channel, the upper socket being for coupling to the left-hand tape input socket of the Hi Fi amplifier and the lower socket for coupling to the Hi Fi amplifier right-hand tape input.

All the above sockets conform to BS666 and will accept the BS666 standard jack plugs.

Controls

Eight controls are available - 4 per channel and as will have been anticipated, the 4 controls in line with the upper meter are only used with the upper track (left-hand amplifier) channel whilst the controls in line with the lower meter are associated with the lower track (right-hand amplifier) channel.

Mixer

The mixer controls will only be brought into use if both Aux and Mic buttons are pressed (see later notes on MIXING).

Record

The record controls will only be effective when the tape deck has been switched to the Record position, then they may be used for the adjustment of signal levels being fed to the Recording head, the levels being indicated on the meters.

A/B Balance

The A/B Balance controls are gain controls, affecting only the level of signal from the Replay head and are termed "A/B Balance Controls" because they must be used when operating the A/B Comparator system of recording in order to adjust the Replay level to be identical to the level of the original signal which is fed 'straight through' the unit when the 'A' button is pressed.

Volume

The volume controls are used to determine the signal levels being fed to the output sockets. They are the master controls over signals being fed to the Hi Fi amplifier.

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RECORDING PROCEDURE FOR STEREO - 2/2 TRACK MODELS

1. Connect machine to mains supply and ensure that power is available by pressing the right-hand ON/OFF button and meters will be illuminated if the power is available. Press switch for 'OFF' for the time being.
2. Connect the Hi Fi amplifier to the stereo tape unit as follows:-
Left-hand channel signals to Upper track Aux socket and right-hand channel signals to Lower track Aux socket. Stereo Unit's Upper track output socket to Hi Fi amplifier's left-hand tape input socket and stereo unit's lower track output socket to Hi Fi amplifier's right-hand tape input socket.
3. Set up the Stereo Unit's push buttons:-

Press Aux

" 'A'

" Frequency correction to match deck speed

" Recording mode (STEREO)

4. Turn all 8 variable controls fully anti-clockwise.
5. Lace tape on deck and select speed to be used.
6. Switch on your Hi Fi amplifier and operate it in the normal manner with Radio, Gramophone pickup etc.
7. Switch Hi Fi amplifier to 'TAPE MONITORING' (this will cut off the signals from your loudspeakers).
8. Press ON/OFF switch of Stereo Unit (meters should be illuminated).
9. Turn clockwise both output volume controls (situated near output sockets) until an adequate sound level is reached.

NOTE: You will now be listening to your 'original' signals prior to them being recorded and before they are applied to the recording amplifier.

10. Switch Tape Deck to Record position (remember to first press the button to the left of the Record/Replay knob) and operate the pause control to 'lock' the tape movement.
11. Turn clockwise the 'Record' controls until peak level signals cause the needles to rise just to the OdB mark on the scale (beginning of the red section).
12. Note the positions of the Record level controls then return them to the fully anti-clockwise position.
13. Carefully release the deck's pause control and advance the 'Record' controls to the positions noted in No.12. Recording should now be taking place.
14. Press Button 'B'
15. Advance A/B Balance controls as necessary to give the same level of sound as was obtained with 'A' button pressed. You are now listening to the recording being replayed a fraction of a second after recording has occurred.

Alternate pressing of the 'A' and 'B' buttons whilst adjusting the A/B Balance controls may be necessary in order to obtain perfect balance. Such adjustments will not affect the recordings, only the Replay levels.

The object of the careful adjustment of the A/B Balance controls is to ascertain that the recorded signal is identical with the original.

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A/B balancing is possible with input signals having levels between 50mVs and 300 mVs. It should be noted that much lower levels of signals than 50 mVs can be satisfactorily recorded (actually signals as low as 8 mVs.) but the signal level from the tape will be greater than that which is passed 'straight through' ('A' button pressed). Conversely higher signal levels than 300 mVs will be greater in the 'A' position than the levels available from the tape in the 'B' position.

The full width of the tape will have been used for the 2/2 track stereo recording, therefore **DO NOT** turn the tape over and attempt further recordings. (See notes on 2/4 track models).

Mono Recordings on 2/2 Track Models

Selection of the appropriate input sockets and recording mode will enable mono recordings to be made on either track e.g. signals into upper track sockets and upper recording mode button pressed will ensure that recording takes place on the upper edge of the tape or signals into the lower input sockets and lower recording mode button pressed for recordings on the lower edge of the tape.

To record to International Standard (recordings suitable for replay on other machines) use only the Upper track for mono recordings, turning the tape over for the second recording.

As only the one output channel associated with the track selected will carry the recorded signal, the other track's output volume control should be turned down (anti-clockwise).

Apart from selecting the recording mode and input channels, the recording procedure will be as outlined in the Stereo Instructions

Replay Only - Press Button 'B'

Place tape on deck in the normal manner.

Switch deck to REPLAY.

Advance A/B Balance controls to maximum.

Adjust output volume controls for desired signal level.

Mono Replay - Turn down output volume control of channel not required.

2/4 Track Models - Stereo

The heads used on these models enable four mono or two stereo recordings to be made.

Recording and Replay procedures are exactly as for 2/2 track but to obtain the second stereo recording, the reel of tape must be turned over, e.g. with a new reel of tape make a stereo recording according to 2/2 track recording instructions. At the end of this recording the right-hand reel will hold the tape, if this reel is now turned over it will be ready for transference to the left-hand spoolholder for recording to continue using the two tracks so far unused. (No further adjustment of Tape Link controls is necessary).

2/4 Track Models - Mono

To Record on track 1 - Press upper record mode button, feed signals into upper track input sockets and adopt normal recording procedure.

To Record on Track 4 - (Tape now wound on to take-up reel) TURN TAPE OVER. Proceed as for track 1.

To Record on Track 3 (Tape on original reel as when recording track 1) press lower record mode button, feed signals into lower track input sockets and adopt normal recording procedure.

To Record on Track 2 (Tape on take-up reel) TURN TAPE OVER and proceed as for track 3.

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Replay 2/4 Track Mono - Press Button 'B'

With tape on original reel, tracks 1 and 3 will be available (1 upper and 3 lower track) whilst with tape on take-up reel tracks 4 (upper) and 2 will be available.

Turn down the output volume control of the track which is not required.

Recording From Microphones

Microphones having impedances of 200 and 600 ohms should be used. (Two mono or special stereo type for stereo recordings).

Press MIC button to bring mic socket into circuit. Headphones of 60 ohms or more impedance may be plugged into the output sockets for monitoring purposes. It is advisable to avoid using loudspeakers for monitoring purposes (unless special effects are required) when using microphones.

Mixing

Signals fed into the Aux and Mic sockets may be mixed if both Aux and Mic push buttons are pressed (steady, equal pressure on both buttons will cause them both to be latched down). When both buttons are down the mixer controls are brought into circuit (working independently on their respective channels, i.e. one cannot mix channels) and when fully clockwise the microphone signals will be at maximum and Aux signals at minimum. Rotating the control anti-clockwise will fade in Aux signals whilst automatically fading out mic signals. When either signal is at maximum the other will be cut off.

With a little practice perfect fading in and out of the two signals will be achieved and a balanced mixing obtained when necessary.

Note that for speech on a musical background to be really clear, the musical level must be very low.

Neither signal should cause the needle of the meter to enter the red portion of the scale - govern this level by means of the Record control.

The use of headphones will be invaluable in assessing the degree of mixing achieved (it is inadvisable to use a loudspeaker for monitoring whilst mixing).

Echo Effects

Whilst warning is given that a loudspeaker should not be operative whilst using a microphone because of the howl which may arise, VERY CAREFUL USE of the loudspeaker output may be used to create an echo effect. The 'B' button must be pressed, the Recording control adjusted for normal recording level and, when the echo is required, the output volume control should be carefully and slowly advanced until the sound from the loudspeaker is picked-up by the microphone. The sound from the loudspeaker will, due to the distance between the record and replay heads, be a fraction of a second behind the original signals received by the microphone, and when recorded will give the illusion of an echo. The time delay will depend upon the tape speed, used at the four speeds of 38, 19, 9.5 and 4.75 cms. the delay will be 1/12th, 1/6th, 1/3 and 2/3 of a second respectively.

IMPORTANT POINTS TO REMEMBER

The Recorder may be mounted in the Horizontal or Vertical position..

Should a tape break or run out during recording or replaying the take-up motor (right hand) will be automatically switched off. The recorder itself however will NOT be switched off therefore make a point of ensuring that the Tape Deck's Record/Replay switch is turned to the central 'STOP' position when the recorder is not in use. To leave the Record/Replay switch to other than 'STOP' with the power switched off would cause 'flats' to develop on the two rubber tyred wheels (idler and pinch) associated with the driving mechanism.

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The back tension on the tape may be adjusted by turning the small recessed screw situated between the left hand spoolholder and the speed change switch. Turning the screw in a clockwise direction will INCREASE the tension. A change of tension is normally only required when small reels or reels with very small diameter hubs are used, such reels will require the tension to be reduced, i.e. turn screw anti-clockwise.

The normal tension is adjusted with a 7" reel of tape in use. With a full 7" reel of tape on the L.H. spoolholder, the back tension should be just sufficient to prevent the tape unreeling jerkily when passing the heads at the selected speed.

The effect of excessive pressure will be to cause 'WOW' which increases as the diameter of the tape on the L.H. reel decreases.

Clean the tape oxide from the heads at frequent intervals. A strip of cloth dampened with water, or one of the many cleansing fluids available for cleaning tape heads, should be gently drawn to and fro across the faces of the heads - each head being treated separately until all trace of oxide is removed. The pinch wheel which presses the tape against the capstan sleeve and the tape guides should be regularly cleaned with dampened cloth (avoid using cloth which will leave a deposit of fluff).

Before switching Tape Deck to the Record mode, ensure that you have selected the Mono or Stereo condition required. (Erase operates on both tracks if the stereo button is pressed).

To record $\frac{1}{2}$ track mono to international standards, the upper track selector button must be pressed and the tape turned over for the second recording. With $\frac{2}{4}$ track heads, the upper button must be pressed for $\frac{1}{4}$ track mono recordings on tracks 1 or 4 and the lower button must be pressed for tracks 2 or 3.

The meters will not operate unless the deck is switched to the record mode.

The tape movement may be immediately arrested if the pause control is moved to the full extent of its movement.

If good quality recordings are to be made, it is essential that the tape be fully and correctly modulated as indicated by the meter readings rising to 0dB points on peak levels.

Do not reduce the output volume levels by reducing the recording levels.

Volume controls which automatically reduce both original and off-tape signal levels are provided - these are the extreme right hand controls, marked 'Volume'.

Coupling leads between the Hi Fi amplifier and the Tape Unit should be of the single screened type (T.V. aerial feeder cable will be quite suitable).

Alternative Aux and Output sockets are provided at the rear of the amplifier unit so that 'out of sight' connections may be made if so desired. For access remove the two front side screws from the cabinet and hinge up the deck and amplifier. The L.H. pair of phono sockets are Aux and the pair adjacent are Output. These sockets will be automatically disconnected should the front jack sockets be used.

HUM

Should an excessive hum to signal ratio be encountered, it should be noted that too many earth leads will introduce what is termed a 'hum loop'. The clearance of a 'hum loop' is achieved only by experimenting with the removal of earth connections. If the associated amplifying equipment is earthed, the Tape Unit will also be earthed by means of the screened cables coupling the various pieces of equipment, therefore, the earth lead (green/yellow in the Tape Unit mains cable) may have to be disconnected from the 3-pin power plug to prevent a 'hum loop'. Hum may be picked up from the transformers of associated equipment (usually by the playback head), it is therefore important to ensure that units with transformers are carefully sited to minimise the effect of the A.C. fields produced by the transformers. To ensure that the optimum position has been selected, switch on all equipment (Tape Unit 'B' button pressed) and if hum is

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1 is/ present (no signals should be fed into it during this operation), move power units or units with mains transformers on them into positions where the least hum is induced into the heads (often the rotation of a power unit is all that is required to accomplish this objective).

Fuses

Two fuses are incorporated in this machine.

Mains Fuse a 2 amp glass housed fuse which is mounted within the mains adjustment plug. For access remove this plug (situated within the circular recess at the rear of the cabinet) and carefully prise off the plastic cover from the plug.

D.C. Fuse a 750 milliamp fuse (plus 1 spare) is mounted internally. For access remove the two domed screws from the sides of the cabinet (FRONT ONLY) so that the unit may be raised on its rear hinges.

The 750 mA fuses are mounted within the power unit in the rear L.H. corner of the cabinet.

Speed Changing

The switch provided has 3 positions but the tape speed will depend also upon the size of capstan sleeve in use.

If the head covers are removed (push fit) one may observe the brass capstan sleeve to the right of the tape heads. The sleeve is a tight fit over the spindle and is retained in position by means of a grub screw (see side of capstan sleeve).

Two sleeves are provided with each recorder, normally the larger sleeve is fitted and the smaller sleeve is stowed in the pocket in the top of the cabinet. When the larger sleeve is in use the 3 speeds of 38 cms. (15 i.p.s.), 19 cms. (7½ i.p.s.) and 9.5 cms. (3¾ i.p.s.) may be selected by means of the speed change switch (see position marked 38, 19 and 9.5) whilst with the smaller sleeve in use, the speeds for each switch position will be halved (see alternate switch markings 19, 9.5 and 4.75).

Note that the switch has but 3 positions and the knob cannot be turned more than 60 degrees. Should a capstan sleeve be changed ensure that there is a clearance of approximately 1/16th inch between the bottom of the sleeve and the top of the bearing which protrudes through the deck plate.

Revolution Counter

A digital revolution counter is fitted. Pressing the button to the right of the counter resets all numerals to zero.

Pause Control

A lever to enable the tape movement to be stopped, move to extreme right-hand side in order to lock control.

Mains Supply Switch

The mains power to both deck and amplifiers is switched by means of the extreme right-hand button on the amplifier's panel - this switch is of the push-push type, i.e. push for ON or OF.

It is suggested that, after loading the machine with tape, the operator should familiarise himself with the deck functions (not necessarily changing the capstan sleeve at this juncture). Check Fast Wind, Fast Rewind, Record and Playback, noting that interlocking prevents the large left-hand knob from being turned when the right-hand knob is in use and vice versa. It is important to remember that the small black button to the left of the Record/Replay knob must be pressed before that knob can be turned to Record. This button will automatically return to the safety position when the Record/Replay knob is returned to the 'stop' position.

Amplifiers, Controls, Sockets and Push Buttons

There are two Recording amplifiers and two Replay pre-amplifiers under the lower panel of the machine and now one should become familiar with the controls of this section.

Push Buttons

The Aux button must be pressed to bring into circuit the two sockets above it (into these sockets the signal from the Hi Fi pre-amps. will be fed for recordings to take place).

The Mic button must be pressed when the sockets above it are required for recording from microphones.

The 'A' button should be pressed when one wishes to hear the signals being fed into the Aux and Mic sockets prior to them being recorded. (Pressing the 'A' button will not prevent recordings being made).

The 'B' button should be pressed when the recorded signal is to be replayed. Thus it will be possible to make comparison between the recorded signal and the original signal as recording proceeds. The 'B' button must of course be pressed when replaying previously recorded tapes.

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